white Tail, much narrower than the Mock-Sun, but which I took to be a Segment of the white Circle which I once saw entire in *London*. Had the Air been clear, I doubt not but much more of the Phenomena of the *Parhelia* might this Time have been obſerved: and I hope, that from our Neighbourhood ſome Member of the *Society* may furniſh us with a fuller Relation. But how to explain theſe Appearances, and account for the Magnitude of theſe Circles, is what ſeems ſtill wanting.

III. *An Account of two* Mock-Suns, *and an* Arc of a Rainbow inverted, *with an* Halo, *and its brighteſt Arc, ſeen on* Sunday *and* Monday, Octob. 22, & 23. 1721. *at* Lyndon, Comitat' Rutland, *communicated by the Rev. Mr.* William Whiſton, *M. A. ſometime Profeſſor of the Mathematicks in the Univerſity of* Cambridge.

ABOUT Ten o'Clock in the Morning, on *Sunday, Octob.* 22. 1721. being at the Houſe of *Samuel Barker*, Eſq; of *Lyndon* in the County of *Rutland*, after an *Aurora Borealis* the Night before (Wind W. S. W.) I ſaw an Attempt towards two *Mock-Suns*, as I had done ſometimes formerly, of which I immediately inform'd Mr. *Barker*, though without any great Expectations of what followed. About ½ or ¾ of an Hour after, I went to view the Heavens, and then found the Appearance compleat; and when Mr. *Barker* and others of the Family were call'd, we all ſaw it, and all ſaw

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ſaw indeed what we had none of us ſeen before; I mean two plain *Parhelia*, or *Mock-Suns*, tolerably bright and diſtinct; and that in the uſual Places, *viz.* in the two Interſections of a ſtrong and large Portion of an *Halo*, (*Fig.* 1.) with an imaginary Circle, parallel to the Horizon, paſſing through the true Sun. I call this Circle here *imaginary*, becauſe it was not itſelf viſible, as it ſometimes has been at ſuch Appearances. Each *Parhelion* had its Tail, of a white Colour, and in direct Oppoſition to the true Sun; that towards the Eaſt was 20 or 25 Degrees long; that towards the Weſt about 10 or 12 Degrees; but both narroweſt at the remote Ends. The *Mock-Suns* were evidently red towards the Sun, but pale or whitiſh at the oppoſite Sides, as was the *Halo* alſo. Upon caſting our Eyes upward, we ſaw an Arc of a curious *inverted Rainbow*, about the Middle of the Diſtance between the Top of the *Halo* and our *Vertex*. I mean this, when Allowance is made for the uſual Inequality, that appears between the ſame Number of Degrees, nearer to and remoter from that *Vertex*. This Arc was as diſtinct in its Colours as the common Rainbow; and, with the like Allowance as before, of the ſame Breadth. The red Colour was on the Convex, and the blue on the Concave of the Arc; which ſeemed to be about 90 Degrees long: Its Center in or near our *Vertex*. On the Top of the *Halo* was a kind of inverted bright Arc, though its Bend was not plain. The lower Part of the *Halo* was among the Vapours of the Horizon, and not viſible. The Angles, eſpecially as more exactly meaſured on *Monday*, near Noon, when the ſame Appearance return'd again, but more faintly, were as follows: Sun's Altitude $22^{\circ}\frac{1}{3}$; perpendicular Semidiameter of the *Halo* $23^{\circ}\frac{1}{3}$; Diſtance of the *Rainbow* from the Top of the *Halo* $23^{\circ}\frac{1}{3}$; Semidameter of the Arc of the

the *Rainbow*, if our *Vertex* be ſuppos'd its Center, 21°. The *Phænomenon* laſted each Day for an Hour and an half, or two Hours. What was moſt remarkable on *Monday* was that the Wind, which on *Sunday* had been almoſt inſenſible, was now become ſenſible, and changed to N. N. E. that the *Halo* was ſenſibly become *oval*; its ſhorter Axis parallel to the Horizon; and the two *Mock-Suns*, which were then but juſt viſible, eſpecially that on the Eaſt, were not in the *Halo*, but a Degree or two without it, which I aſcribe to the unuſual Shortneſs of the Horizontal Diameter; which Poſition of the *Mock-Suns* does not appear to have been hitherto taken Notice of by any, though it was now very ſenſible.

On *Thurſday* Morning, *Octob.* 26. as I was coming in the *Northampton* Coach towards *London*, about 9 o'Clock, the *Halo* returned larger and clearer than before; and the two *Mock-Suns* juſt attempted an Appearance therein, as on *Sunday*; but the Air becoming thicker and thicker towards Rain, I ſaw them no more. I add nothing to this Account, but only, that *Aug.* 30. before, I ſaw at the ſame Place *Rutland* a remarkable *Halo*, whoſe upper Part had its inverted Arc reddiſh within, and pale without, but brighter and more vivid than ever I ſaw in my Life: That we had there, *Sept.* 11. in the Evening, the lighteſt and moſt remarkable *Aurora Borealis*, with its unaccountable Motions and Removals, that ever I ſaw; excepting that original one, *March* 6, 171$\frac{1}{8}$: That it was ſeen in *Northamptonſhire*, at the *Bath*, and elſewhere: That the *Vertex* of the Columns which ſhot upwards, was not our *Vertex*, but evidently 15 or 20 Degrees diſtant towards the South; and that the Wind was in *Rutland* North, as I obſerved myſelf; at the *Bath* Weſt, as Mr. *Molyneux* obſerved; and, as I am inform'd by Sir *Robert Clarke*, in *North-*

amptonſhire

amptonſhire South; all at the ſame Time, which deſerves particular Reflection. But then, if any Reader expects here the *Solution* of all theſe *Phænomena*, he is to know, that as to theſe *Northern Lights*, Dr. *Halley* has communicated his Thoughts to the Publick in the *Philoſophical Tranſactions* ſoon after the firſt Appearrance; and I communicated mine about the ſame Time in a ſmall Pamphlet. And as to the *Halo's*, *Mock-Suns*, *Inverted Arcs of Rainbows*, and other *Phænomena* of the like Nature, Monſ. *Huygens* has moſt accurately explained them in his *Poſthumous Works*, from *p.* 293 to *p.* 366. and Sir *Iſaac Newton* himſelf has touched upon them in his *Opticks*, 1ſt *Edit. p.* 134. to which the *Inquiſitive Reader* may have Recourſe for his Satisfaction. Only if any enquire farther, Why the *Northern Lights* have of late been ſo unuſually frequent, I muſt declare, I am far from having ſatisfied myſelf, and ſo ſhall not pretend to offer any Thing for the Reader's Satisfaction.

London, Nov. 6. 1721,

Will. Whiſton.

IV. *Ob-*

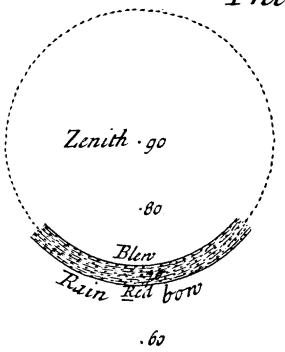


Fig. 1.

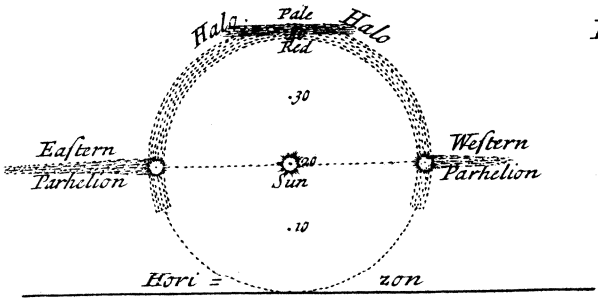


Fig. 2.

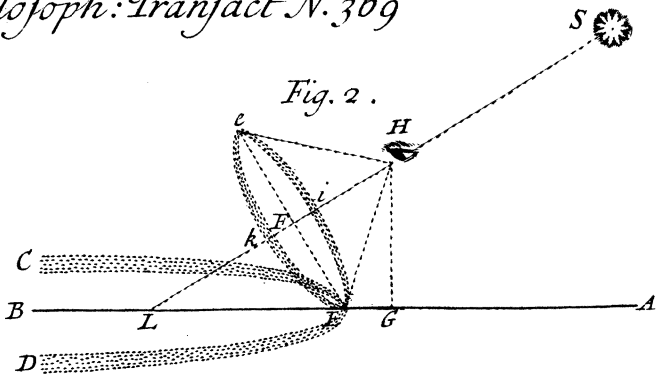
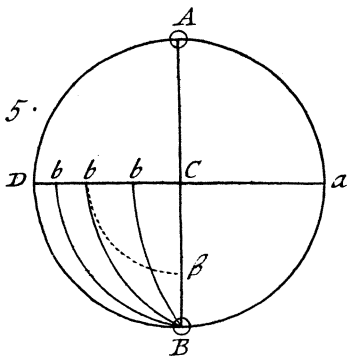


Fig. 5.



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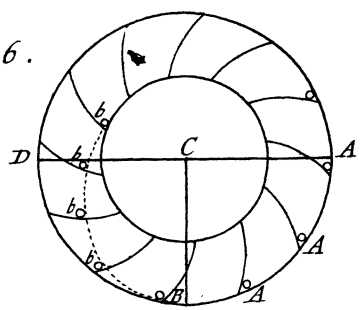

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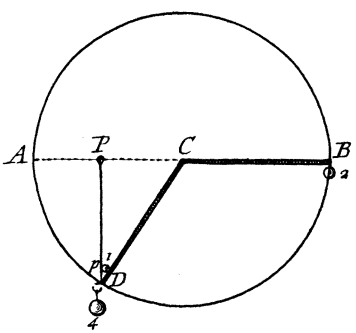

Fig. 3.

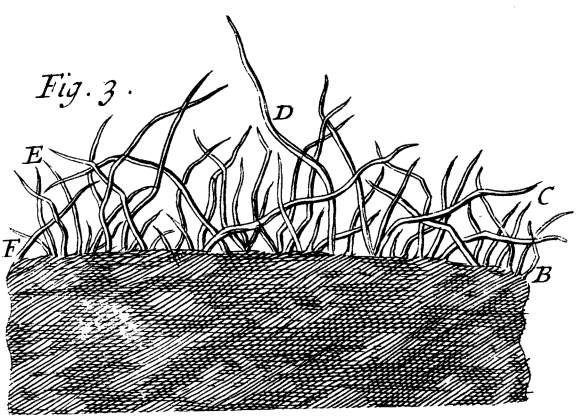

Fig. 4.